

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Patent Application No. 10/753,366

REMARKS

Claims 17-29 are all the claims pending in the application. Claims 1-16 have been cancelled and new claims 17-29 have been added.

New Claim 17 contains all limitations of original claim 2 and further defines the thickness of a nonmagnetic flexible polymer support. Support for this limitation can be found in, for example, the disclosure of a paragraph spanning from page 20 to page 21.

New Claims 18-29 depend directly or indirectly from Claim 17. Support for Claim 18 can be found in, for example, the disclosure of the paragraph spanning from page 20 to page 21. Support for Claim 19 can be found in, for example, the disclosure of the paragraph spanning from page 19 to page 20. Support for Claim 20 can be found in, for example, the disclosure of page 12, lines 7-14. Support for Claim 21 can be found in, for example, the disclosure of page 24, lines 18-20. Support for Claims 22 and 23 can be found in, for example, the disclosure of page 21, line 25 - page 25, line 1. Support for Claim 24 can be found in, for example, the disclosure of page 24, lines 12-17. Claims 25 - 27 are identical to original claims 4 and 6, respectively. Support for Claim 28 can be found in, for example, the disclosure of page 1, first paragraph and of page 19, lines 18-23. Support for Claim 29 can be found in, for example, the disclosure of page 14, lines 16-20.

Accordingly, no new matter has been introduced, and it is respectfully requested that the amendment be entered and considered.

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Rejection of Claims 1-6 and 9-14 under 35 U.S.C. § 103

Claims 1-6 and 9-14 stand rejected under 35 U.S.C. § 103 as being obvious over Japanese patent application publication No. 7-254128 (“JP 7-254128”) in view of Kaitsu et al. (U.S. Patent No. 6,562,481). Claims 1-6 and 9-14 have been canceled. New Claim 17 is substantially identical to original Claim 2 and has a further limitation of the thickness of a support. New Claims 18-29 depend directly or indirectly from Claim 17. Thus, Applicants will discuss the rejection in the context of Claim 17. Applicants respectfully traverse the rejection for the following reasons.

JP 7-254128 is relied upon to disclose a magnetic recording medium having a polymeric substrate, a first ceramic underlayer formed from SiO₂ or a Ti-containing compound, a second layer formed from Cr or a Cr alloy, and a magnetic layer formed from a CoPtCr alloy.

Kaitsu et al. discloses a magnetic recording medium comprising a non-magnetic substrate and a recording layer, wherein the recording layer has a non-magnetic matrix (e.g., SiO₂), a primary layer, and crystal grains of a ferromagnetic material. According to Kaitsu et al., the crystal grains are formed from a CoPtCr alloy. (Column 7, line 62 - column 9, line 19.) Kaitsu is relied upon to teach that a granular magnetic layer in the magnetic recording medium is formed from a CoPtCr alloy grains with SiO₂ at the grain boundaries effectively decoupling the magnetic grains and improving the signal to noise ratio.

It was conceded that JP 7-254128 failed to teach the use of a nonmagnetic compound in the magnetic layer. Nevertheless, it was alleged that it would have been obvious to one skilled in

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the art at the time of invention to add silica to the CoPtCr magnetic layer taught in JP 7-254128 in order to decouple the magnetic grains and improve the signal to noise ratio.

The present invention is directed to a magnetic recording medium comprising a nonmagnetic flexible polymer support, a first under layer, a second under layer, and a magnetic layer. The first under layer is constituted by a nonmetal element, a nonmetal element-containing compound, or a compound containing titanium and a nonmetal element, and the second under layer contains at least one element selected from the group consisting of chromium, titanium, iridium, platinum, palladium, ruthenium, rhodium, rhenium and osmium. The magnetic layer contains a ferromagnetic metal alloy containing at least cobalt, platinum and chromium, and a nonmagnetic compound, which may be exemplified by SiO_2 .

According to the present invention, the nonmagnetic flexible polymer support has a thickness of from 10 to 200 μm . In contrast, the substrate of JP 7-254128 is made by an injection molding and has a thickness of 1.5 mm (Example 1 of paragraph [0014]) or 2 mm (Examples 2-7 of paragraph [0023]). The laminate structure of JP 7-254128 cannot be applied to a support of 10 - 200 μm thickness without deforming the support. A thin support having a thickness of 10 - 200 μm , as recited in claim 1 of the present invention, is vulnerable to damage by heat, compared to a thick support as taught by JP 7-254128, and, therefore, it is not easy to form a thin film such as an under layer onto the thin support. In addition, a surface roughness of the support of the present invention differs from that of the support of JP 7-254128. Accordingly, one skilled in the art would not have been motivated to apply a layer structure of JP 7-254128 to

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the thin support of the present invention with reasonable expectation of success without further modification.

In the magnetic recording medium of the present invention, recording and reproduction are made during when a magnetic head is rubbed on the support (Claim 28). In contrast, the magnetic recording system of JP 7-254128 records and reproduces the recorded data in a way that a magnetic head flies from the magnetic disk. Examples 1-9 of JP 7-254128 discloses that a support is formed by an injection compression molding process. Injection molding process produces a hard support. The magnetic recording system using a hard support, as taught in JP 7-254128, records and reproduces recorded data in a way that a magnetic head flies from the magnetic disk. See, the Background of the Invention section of the instant application. If such a hard support contacts with the magnetic head, the magnetic head would be damaged. In contrast, the support of the present invention is a flexible support, and therefore, the contact of the support with a magnetic head would not cause damage to the magnetic head. Further the magnetic recording medium of the present invention has a subbing layer which is provided with protrusions on its surface. (Claim 20.)

The magnetic recording medium of Kaitsu et al. has, as a support, an aluminum substrate which may be coated with NiP. (Col. 7, line 65 - col. 8, line 5.) Although Kaitsu et al. discloses a recording layer made from CoPtCr dispersed in SiO₂ matrix, neither of JP 7-254128 or Kaitsu provides motivation or suggestion to modify the magnetic recording medium as taught by JP 7-254128 to make the magnetic recording medium as claimed in the present invention, as none of these references describes modification of the thickness of the flexible polymer support.

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Accordingly, it is respectfully submitted that the rejection is not sustainable and Applicants respectfully request that the rejection be withdrawn.

B. Rejection of Claims 7, 8, 15 and 16 under 35 U.S.C. § 103

Claims 7, 8, 15 and 16 stand rejected under 35 U.S.C. § 103 as being obvious over JP 7-254128 in view of Kaitsu et al. and further in view of Shinohara et al. (U.S. Patent No. 6,740,383).

Claims 7, 8, 15 and 16 have been canceled and, thus, it is believed that the amendment renders the rejection moot.

C. New Claims 18-29

New Claims 18-29 are dependent directly or indirectly from Claim 17. As discussed above, Claim 17 is allowable over the cited references, and Applicant hereby respectfully submit that Claims 18-29 also are patentable over the references.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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